WS-100
USER'S MANUAL

WatchDog™

Bugging Device Detection System

WORI TECHNOLOGY

Table of Contents

WatchDog™

Introduction

Thank you for purchasing the WatchDog™ bugging device detection/monitoring system.

The WatchDog™ has been designed to give you years of service as bugging device detection system. After the complete and thorough sweep is performed by TSCM professionals, WatchDog™ can be easily setup for 24 hour monitoring for wireless bugging devices.

This manual is organized to get you started quickly and easily. The installation and operation section will lead you through the simple set up for WatchDog™ as well as what you will need to know to get the most out of WatchDog™.

Your WatchDog™ package contains

- · WatchDog™ unit
- · Power cord cable
- · 2 antennas
- · User' s manual
- · Warranty Card

After powered up, WatchDog™ searches the whole frequency range and automatically sets the reference frequency to determine whether there are any Bugging Devices or not.

It decides whether or not there is any Bugging Devices after comparing the present frequency with the reference frequency (the average frequency value 1(ND1) during the first period after WatchDog™ is installed and the average frequency value 2 (ND2) during the latest period).

Hence, WatchDog™ may not detect some Bugging Devices installed before WatchDogTM runs and some high-price or high-tech Bugging Devices beyond WatchDog™s detecting ability. So, for the perfect security environments, you have better take the Sweeping Service before installing WatchDog™ and consult the wpecialist regularly once or twice a year.

※ When you get the sweeping service, you can also get the total consulting service for wired eavesdropping equipment including wireless ones.

※ IF you doubt any bugging possibility, please inform the consultant NOT in the very location you doubt but the one where the security is insured.

WatchDog™

Features

The WatchDog™ scans a wide range of frequencies and analyzes the spectrum patterns with its advanced analytical algorithm. It alerts user the possible presence of wireless bugging devices, including hidden video camera. Its detection range is up to 1000 sq. ft.

Your WatchDog™ will:

- Scan and examine frequencies extensively in the range of 1.7 MHz to 2.4 GHz by 50kHz bandwidths.
- Detect the presence of VOX(Voice Activated) type bugging device by sending out entrapment signals with its built in speaker.
- Detect the presence of weak transmitting power device of which range is between -110dBm and -60dBm
- Perform scanning for frequencies 1)normal range 2)specific range defined by user.
- Be customized to exclude a certain frequency(such as broadcasting frequency, normal RF by office equipment etc) specified by user.
- Perform Low band, High Band Synchronous scanning.
- Issue 4 levels of Alarm based on frequency scanning and analysis.
- Be controllable in a remote location
- Perform advanced interface with your current security, surveillance system, Internet, and Network
- Provide real time frequency spectrum information to you on its LCD screen.
- Perform automatic set up and self diagnosis.
- Let you hear the demodulated signal with headphone set at the suspected frequency detected.
- Various type of Network Interface
- RS-485 : Watchdog™ can be connected to other Watchdog™ up to 32 units
- RS-232C : Connected to PC
- Ethernet : Company LAN and/or Internet
- Control port(Discrete I/O) : Connected to security system.

WatchDog™

Installation and Setup

WatchDog™

A. Typical Configuration

1. Key Pad
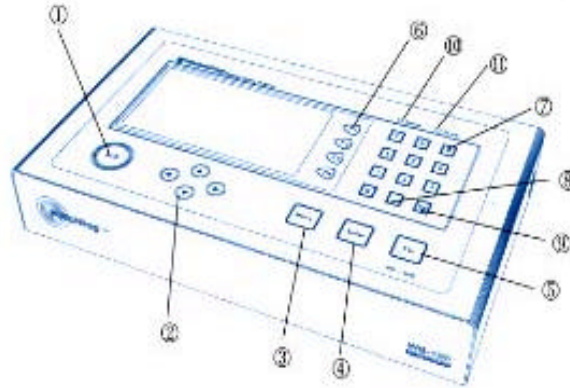
① ACK(Acknowledgment Key) [Ack]

When alarm goes off by detecting suspicious frequency(4 different type of Alarm Satus from analysis of the frequency), press ACK key to acknowledge the event.

② Cursor Direction Key:

To move cursor to different directions in Event List, Frequency Table, Time set up, Event Trend, Real-time spectrum screen.

③ Menu Key [Menu]

When pressed, "Main menu" appears. From this "Main menu screen", you can select one of the main functions F1(real time spectrum screen), F2(Event List), F3(Event Trend) and F4(Setup).

④ Enter Key [Enter]

Press when you complete the entry of specific numbers and values.

⑤ ESC Key [Esc]

Cancel the previous action/entry or to return to the previous screen. 1)When "Main Menu" appears, pressing ESC key will make "Main Menu" disappears. 2)When you are at the first screen of each main functions. Pressing ESC key has no effect.

⑥ (Function key)F1, F2, F3, F4 Key

To perform each functions, press corresponding key.

⑦ **Number** Key

To enter numbers

⑧ **(Dot)** key ☐

To enter the decimal point of numeric values.

⑨ **DEL** Key ☐ Del

To erase the numeric entry by one digit or to delete the entry in Event List

⑩ **Alarm LED**

On or OFF based on Alarm Status

⑪ **Power LED**

When power is on, the LED lit.

2. Earphone Jack
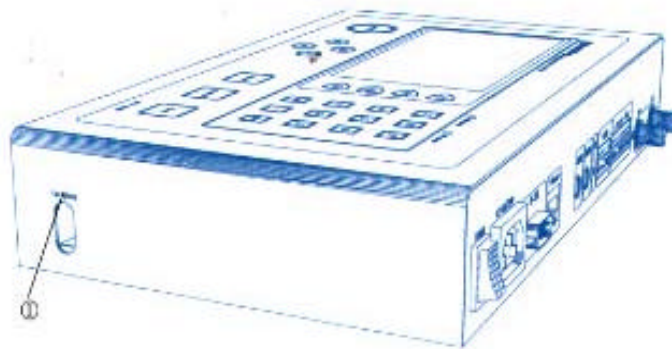
① **Earphone Jack**

When there is an "Event", you can hear sound of the specific frequency with earphone
set(not included)

3. Microphone & Speaker
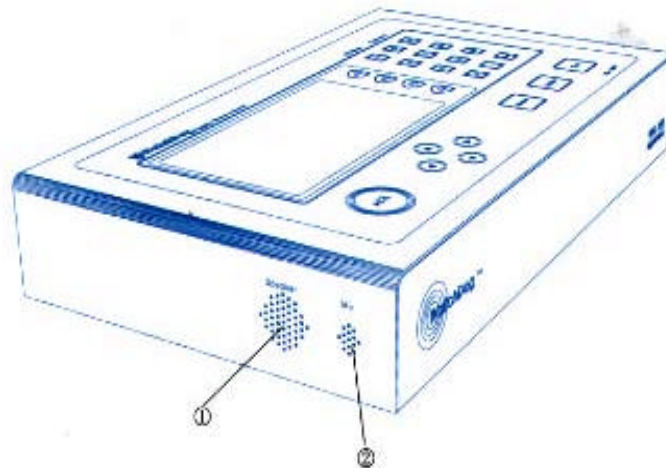
① Speaker
To issue alarm sound when the event occurred. It is also used to send out "entrapping sound signal" to detect VOX(Voice Activated) type bugging device.

② MIC(Microphone)
To listen to surrounding sounds and detect VOX type bugging device.

4. External Connections
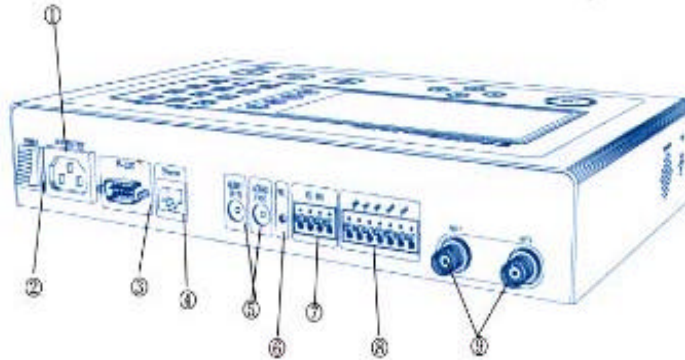
① **Power Cord**

② **Main Power On/Off Switch**

③ **RS-232C Port**
For the connection to PC

④ **Ethernet Port**
For the connection to LAN(Local Area Network)

⑤ **ADDR0 and ADDR1**
When WatchDog™ is connected to each other with RS-485 port, you can set up each WatchDog™ ID(identification number)with this port to diffrentiate each WatchDog™

⑥ **VOL(Volume switch)**
To control the volume of the speaker

⑦ **RS-485 Port**

⑧ **Input/Output Port**
- Input jack : Din0 and Din1
- Output jack : Digital output Jack. There are 2 jacks to Dout0 and Dout1.
- GND(ground) : To be used for both Din0 and Din1

⑨ **ANT1 and ANT2**
Connection of the 2 antennas

B.Connections

Basic Connection

· Connect 2 antennas to each port in the back panel.
· Connect the power cable to the power source.
· Turn the power switch on and it will start automatic setup and self diagnosis.
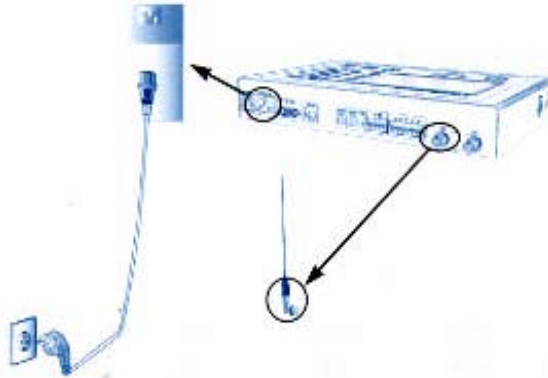
Connection of the WatchDog™ to PC, and other WatchDog™

1. WatchDog™ to PC with RS-232C
(To monitor multiple WatchDog™ units centrally by PC)
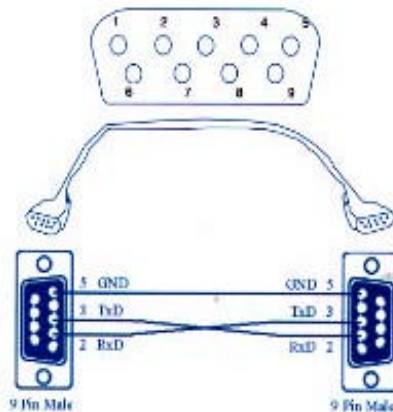
· Connect the cable as shown in the diagram

2. WatchDog™ to External Device

(To send out alarm signal to external device (Alarm light, speaker, security system) with Din and Dout port)

When the event occurred, WatchDog™ can send the signal to other external alarm device with this basic connection.
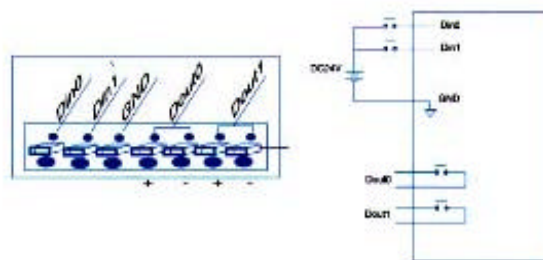
Port	AS1	AS2	AS3	AS4	Signal Level
Dout0	ON	OFF	ON	ON	DC30V, 1A
Dout1	OFF	ON	ON	ON	Dry Contact.

※ AS1menas Alarm Status 1.

Installation

✳ CAUTION

· Do not install the equipment on combustible material, such as wood.
· Install the equipment in a location free from radioactive materials and combustible materials.
· Install the equipment in a location free from harmful fasses and liquids.
· Install the equipment in a location without excessive oscillation.
· Install the equipment in a location free from chlorides.
· Install the equipment in a locationnot in direct sunlight.

3. WatchDog™ to WatchDog™ (with Din/Dout port)
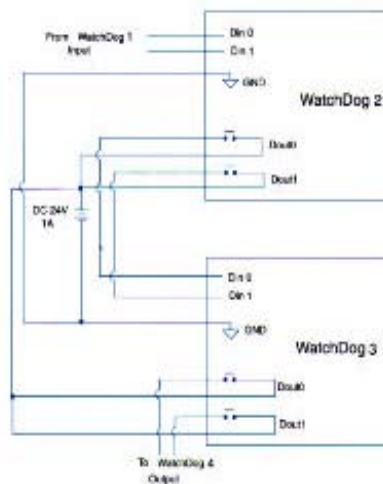
· WatchDog™ relays the alarm signal to other WatchDog™ units connected. The alarm signal from unit #1 goes out through Dout port to WatchDog™ unit #2 and unit #2 send out signal to unit #3.
· The in/out signal relay information appears in "Link Information Screen"

4. WatchDog™ to WatchDog™ with RS-485 port
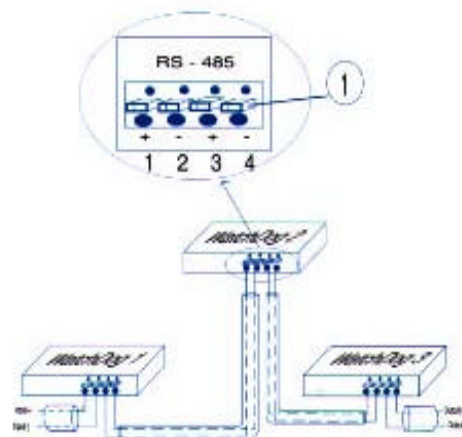
· Using RS-485 port, you can connect other WatchDog™ units. To release the cable, press position ①

· These are the maximum length of the cable to be used when connect is made between WatchDog™s

Type of the Cable	Maximum Length
Shielded Twisted Pair(AWG18)	3200ft
Twisted Pair(AWG18)	900ft

5. WatchDog™ Address(ID)Setup

· Unit ID(Address) setup is done by ADDR0 and ADDR1 switch in the back panel.
· You should set different ID(Address) to different unit.
· ID(Address) is between 1 and 32
· The first digit is set by turning ADDR0 switch to arrow mark.
· The second digit is set by turning ADDR1 switch to arrow mark
· The WatchDog™ unit connected to PC by RS-232C port typically set to be 1(ID number 1).
 The rest of unit is between 2 and 32
· After all the units are successfully connected each other with RS485, the other units (with ID between 2 and 32) can also be connected to PC(RS-232C). However, this may cause some delay in relaying the signal.

WatchDog™

Basic Operation

WatchDog

Basic Operation Screen

· When the power is on, this screen appears

WATCHDOG

Initializing

RAM Test..... OK
RTC Test..... OK
COM Test..... OK
I / O Test..... OK
RF Test..... OK
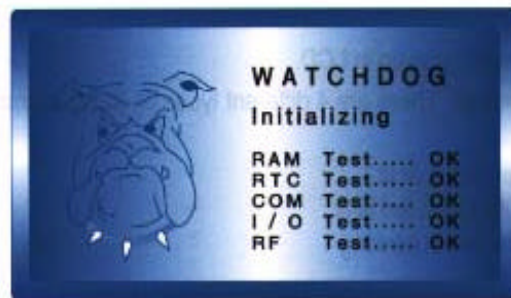
< Automatic Self Test Screen >
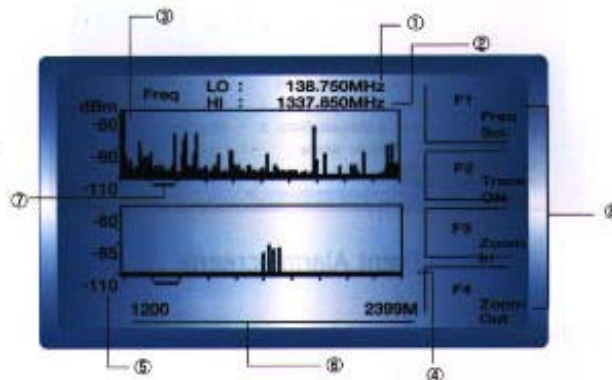
< Real Time Spectrum Screen >

① Scanning Frequency of the Low Band Range(1.7MHz-1.2GHz)

② Scanning Frequency of the High Band Range(1.2GHz-2.4GHz)

③ Real time Spectrum of frequency scanned-Low Band

④ Real time Spectrum of frequency scanned-High Band

⑤ Density of the frequency(dBm)

⑥ Range of Frequency(MHz)

⑦ Cursor which shows range of frequency being scanned. You can move the cursor to any frequency range which you wishs to take closer look.

⑧ Functions which can be invoked in Real Time Spectrum Screen.

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When the Event occurs

When the event occurs,

1. "Event Alarm" screen pops up in LCD.
2. "Alarm sound" goes off. There are 4 different types of alarm sounds based on "Alarm Status"
3. "Alarm LED" either blinks or lit.
   · Alarm Status 1(AS1)-the led is lit
   · AS2/AS3/AS4-the led is blinking

<Event Alarm Screen>
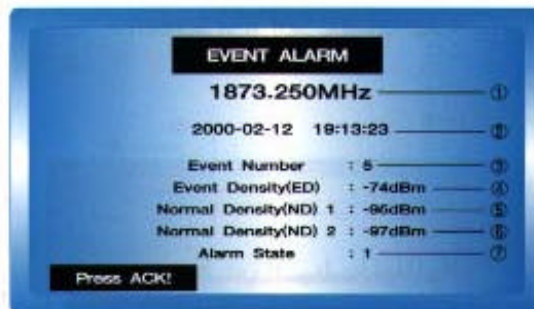
① Frequency of the Event

② The date and time of the Event

③ Event ID Number

④ Event Density-the density of the frequency detected(dBm)

⑤ ND1(Normal Density 1) - The average density of the frequency for the first 24 hours after setup.

⑥ ND2(Normal Density 2) - The average of density of the frequency detected recently.

⑦ Alarm Status

What to do

1. Please review "Event Alarm" Screen information and confirm the Event Number. This number is used to locate this specific event from the "Event List"
2. When another Event occurs before you press ACK key(Acknowledge key) for the current Event, the "Event Alarm" screen shows the newer Event after you press ACK key. Please check the "Alarm Screen" before you press ACK key
3. You can get more information on Events using F2(Event List) and F3(Event Trend)function from Main Menu screen by pressing Menu Key.

How to Listen to Sound at Specific Frequency

1. By using "Event List"

- Press Menu Key and then press F2(Event List) key
- Move cursor to the event frequency
- After cursor is on the desired frequency, press "Enter" key and the screen will show detailed information of the Event
- Press F4 key to "Hear On" status
- Connect Headphone set to the Jack and you can listen to the sound(voice)

2. By entering specific frequency

- Press Menu key and then F1 key to real time spectrum screen
- Press F1 key again to show "Enter Frequency" box. Enter a specific frequency using number Key pad(the unit is MHz), Then press Enter key.
- When you see "Locked" on your LCD screen, connect the headphone jack to the unit to listen.
- When other keys are pressed, the "Locked" message on the LCD screen will disappear and you can not listen to the sound at the frequency you set.

Advanced Operation

WatchDog™

A. Edit and Setup

Setup and Configuration

- WatchDog™ has initial configuration setting from the factory
- Press "MENU" key and "F4(Setup)" key to bring "Configuration screen
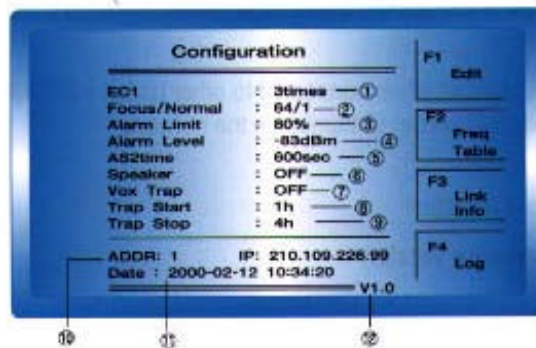
< Configuration Screen >

① EC1(Event Count)

Number of events(AS3(Alarm Status 3) or AS4) to be counted in order to trigger the "Alarm" The value is between 1 and 10.

② Scanning Rate between specific range frequencies(focused) and normal range frequency. 64:1 means 64 times repeated scanning of specific range(focused) frequency while performing one scanning for normal range frequency scanning. Maximum ratio is 64:1

③ Alarm Limit

When the difference of frequency density between scanned and ND1 or ND2 is greater than Alarm Limit value of either ND1 or ND2, the alarm goes off. The value is 20%-99%

④ Alarm Level

The minimal density of the frequency to initiate the alarm. When there are too many events, increase this value. (for example, Alarm level of -73dBm will have less events than Alarm Level of -83dBm)

⑤ AS2time

Minimum period of time to convert AS1(Alarm Status1) to AS2. It ranges from 10

seconds to 10 minutes. It is set by the 10 seconds

⑥ **Speaker**

ON/OFF status of speaker. On status will enable you to hear alarm sound

⑦ **VOX Trap**

Entrapment sound signal ON/OFF status

⑧ **Trap Start**

Time to start sending entrapment signal. It is between 0 Hr to 23Hr

⑨ **Trap Stop**

Time to stop sending entrapment signal. It is between 0 Hr to 23Hr

⑩ **ADDR**

Unit ID(Address) Number when connected to other units by RS-485 cable. ** indicates that there is duplicated(same) ID number in the network

⑪ **Date**

Time and Date of the system

⑫ **WatchDog™ Firmware Version**

How to Edit on Configuration Screen

1) Press F1 key on Configuration Screen. Password entry box pops up.
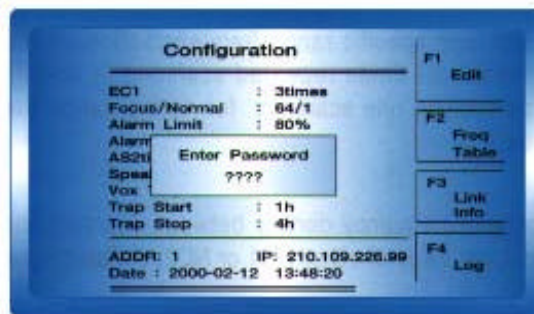
2) In order to edit, you should enter password using numeric keypads.
3) After you enter correct password, Password entry box disappear and EC1 value will be shown inverse. Use direction key to move cursor and edit using numeric key pads

followed by pressing "Enter" key. If you want to return to previous setting, press "ESC" key before you press Enter key.
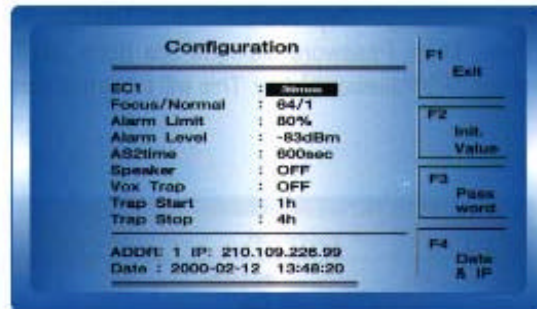
4) **At the edit mode in Configuration Screen,** you cannot go to "Main Menu" by pressing "MENU" key. Instead, you have to exit(by pressing F1 key) to bring "Main Menu" by pressing "MENU" key.

5) **F2(Init. Value-Initial Value or Default Value)**
You can return to factory setting default value by pressing F2 key. This will cancel all the edits and changes you have made(including ND1, ND2)

6) **F1(Exit) key**
After completion of edit, press F1(Exit) key, then "confirmation dialogue box" pops up. You can either save changes or cancel.
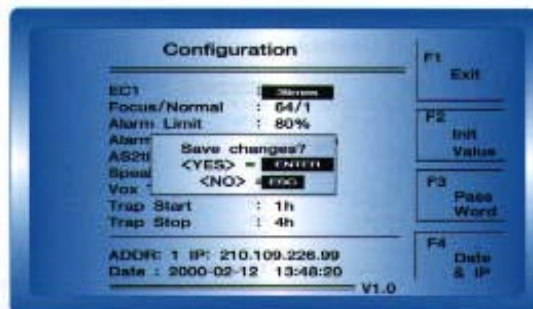
How to Edit Password

1) The factory preset password is "0000" (four zeros)
2) Press "MENU" key, "F4(Setup)" Key. You are now in "Configuration Screen"
3) Press "F1(edit)" key. Then, Password dialogue box pops up. Enter 0000 as your password. Then press "F3(Password)" key. This will bring this screen to you
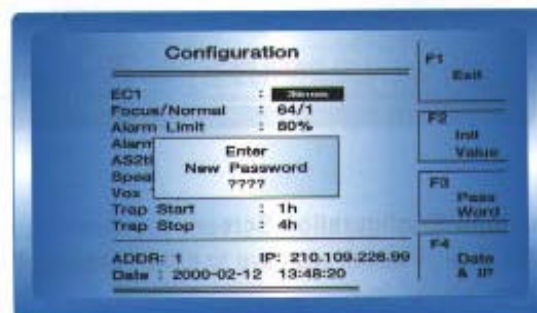
4) Enter 4-digit password of your choice and press "Enter" key. Re-enter password for confirmation.
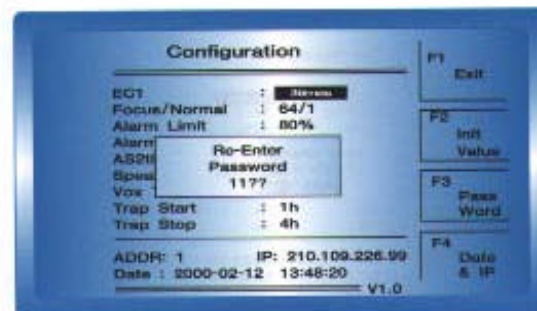
How to Set Date and Time

1) The Event log(date and time) is from the time of internal clock of WatchDog™. It is important that you set current date and time of your region at initial setting.

2) Press "MENU" key, and "F4(Setup)" key. This will bring "Configuration" screen. Press "F1(Edit)" key, enter password then press "F4(Date and IP)" key

```
        DATE SET UP          F1
                                Save
        2000 - 05 - 29
          13:50:26           F2
                               Cancel

        IP  SET  UP          F3
        210.109.226.099         Date
           Gateway
        000.000.000.000      F4
                                IP
```
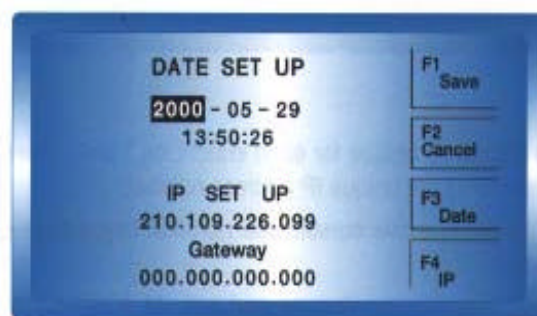
3) Press "F3(Date)" key to edit time and date. Move cursor with "direction key" to edit. Press "F1(Save)" to save change and exit.

How to Edit IP Address

1) In order WatchDog™ to communicate with PC MMI(Man-Machine Interface) by Ethernet, unique IP should be assigned to each unit.

2) Press "MENU" key, "F4(Set up)" key. This will bring you configuration screen Press "F1(Edit)" and enter your 4 digit password then press "F4(IP)" key

3) The IP address should be unique for each WatchDog™ unit. Please consult with your network administrator to get unique IP address number

4) Use "Direction keys" to move cursor. Use numeric keypads to enter numbers and press "Enter" key.

5) Press "F1(Save)" key to save change and exit. At "Configuration" Screen please confirm the changed IP address and then turn the power off for 1-2 minutes and turn power back on. After this, WatchDog™ is working with new IP address.

How to Setup Gateway

1) By setting up Gateway, a remote control of WatchDog™ is available on internet and/or VPN(Virtual Private Network)

2) Press "MENU" key, "F4(Set up)" key. This will bring you "Configuration" screen press "F1(Edit)" and enter your 4 digit password then press "F4(IP)" key
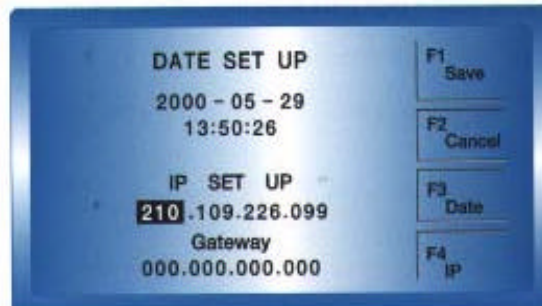
3) After setting up IP, press "Enter" key. When you press "Enter" key. The first 3 block address of IP is copied to the first 3 block address of Gateway. Move cursor by using directional keys to edit Gateway address. Please consult with your network administrator for Gateway address number. (The subnet mask of WatchDog™ is 255.255.255.0 and is not subject to change)

```
        DATE  SET  UP              F1
                                     Save
         2000 - 05 - 29
           13:50:26              F2
                                    Cancel

        IP   SET  UP              F3
       210.109.226.099             Date
            Gateway
       210.109.226. 000           F4
                                    IP
```
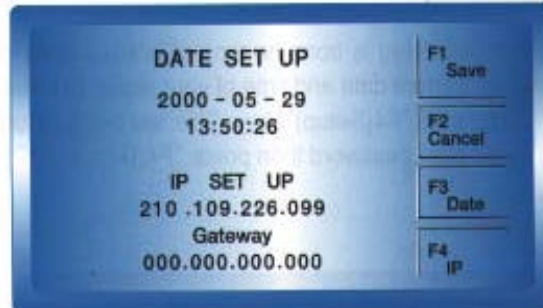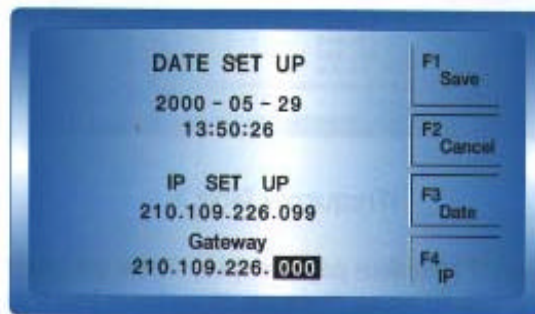
4) Press "F1(Save)" key to save change and exit. At "Configuration Screen" please confirm the changed IP address and then turn the power off for 1-2 minutes and turn power back on. After this, WatchDog™ is working with new Gateway address.

How to Set User Defined Frequency Table

1) You can specify a certain range of frequency to set scanning priorities. WatchDog™ scan more number of times which has higher priorities.

2) There are 3 types of range.
- · Type 1---Skip range
- · Type 2---Focused range
- · Type 3---VOX type device
- · The rest---the rest of frequency range are automatically assigned to normal scanning range

3) Press "MENU" key, and "F4(Setup)" key and "F2(Freq. Table)" key

<Frequency Table >

4) F2(Next Page View), F1(Previous page view) key. There are maximum 200 entries of frequency range in total 10 tables. There are 10 entries of frequency range per table.

5) The left bottom indicates current cursor location in the table.

6) The right Bottom indicates page number of the current screen.

7) If you wish to return to "Configuration Screen", press "ESC" key.

8) In order to edit Frequency Table, press "F3(Edit)" key and it requires you to enter password.

9) After entering the correct password, the screen changes to Edit Screen. Use directional key to move cursor. You can use numeric keys to enter value of the frequency. When the value entered is in KHz, press "F3" key. If it is in MHz, press "F4" key or "ENTER" key

10) To delete a specific range of frequency, move cursor to "Type" column of that row of the frequency and press "DEL" key. The information on that row will be deleted.

11) If you want to return to initial factory set value, press "F2" key.

12) After completion of edit, press "F1(Exit)" key, which will bring this screen. In order to save change and exit, press "ENTER" key, If not, press "ESC" key.
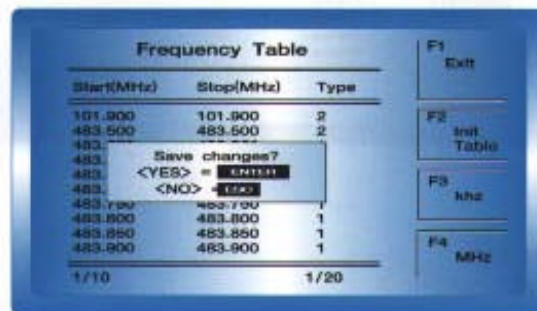
Monitoring other WatchDog™ unit connected with RS-485

1) When WatchDog™ units are connected each other with RS-485 cables, you can monitor all the units from" Link Information" screen from any unit.

2) Press "MENU" key, "F4(Set up)" Key, "F3(Link Info)" key This will bring you "Link Information" screen.

3) NR(Normal), NC(Not connected), AL(Alarm) status will show in the screen.

4) All the WatchDog™ should have distinctive ID(Address) between 1 and 32 in order to communicate properly. There must be a WatchDog™ unit which has 1 as ID(address).

5) Move cursor to a specific WatchDog™ unit and press "ENTER" key. This will bring you "WatchDog™ status screen".
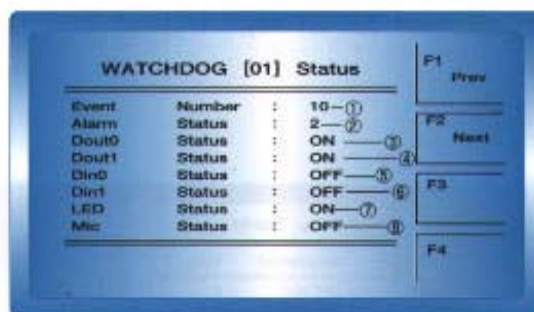
① **Event Number**
Most recent event number

② **Alarm Status**
Indicates alarm status 1, or 2, or 3 or 4

③ **Dout0 Status**
Dout 0 jack connection status in on/off

④ **Dout1 Status**
Dout 1 jack connection status in on/off

⑤ **Din0 Status**
Din 0 jack connection status in on/off

⑥ **Din1 Status**
Din 1 jack connection status in on/off

⑦ **LED Status**
· ON-Alarm goes off. This indicates alarn status 1.
· Blink-Alarm goes off. This indicates alarm status 2, 3 or 4
· Off-Alarm is off

⑧ **Mic Status**
ON/OFF---this indicates whether microphone is sensing the sounds from the
surrounds.

· In the WatchDog™ Status Screen, press "F1(Prev)" key to bring WatchDog™
Status Screen of previous ID unit. "F2(Next) will bring you that of next ID unit.
· Press "ESC" key to return to "Link Information" screen.

Event Log Information

1. Up to 100 Events are logged. The record of any change/edit/delete on "Event List" screen is also logged.
2. Press "MENU" key, "F4(Setup)", "F4(Log)". This will bring you "Log Information" screen.
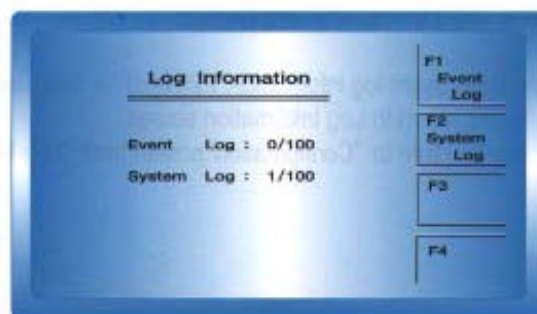
< Log Information Screen >

3. Press "F1(Event Log)" key to bring Event Log screen
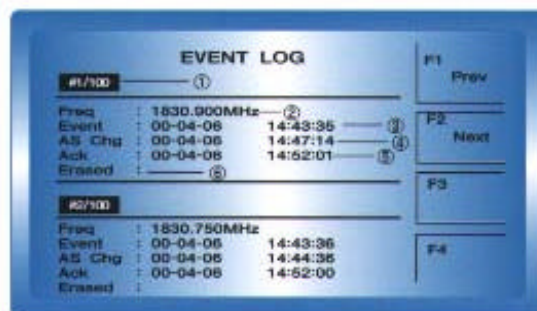
< Event Log Screen >

① **Event No.**

② **Freq**
   The frequency at which the event has occurred.

③ **Event**

Date/Time of Event occurred

④ **AS Chg**

Date/Time that alarm status of this event became alarm status 2 from alarm status 1.

⑤ **ACK**

Date/ Time of ACK key was pressed by user

⑥ **Erased**

Date/ Time of the event is erased from event list.

· F1(Prev) for previous event log information. F2(Next) for next event log screen.
· Press "ESC" key to return to Log Information screen
· Press "ESC" key to return to "Configuration" screen from "Log Information" screen.

System Log Information

You can review system log information for change you made on Configuration, Frequency Table, Time, and Power on

Press "MENU", "F4(Setup)", "F4(Log)". Now you are at Log Information Screen Press "F2(System Log)" key to bring System Log Screen.
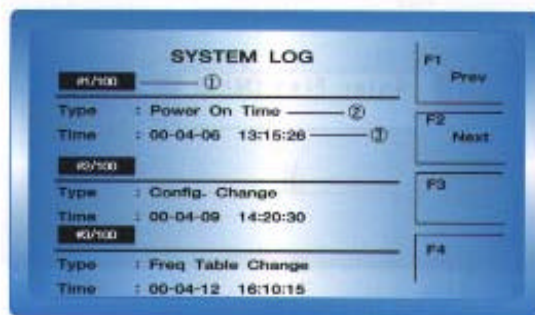
< System Log Screen >

1) Indicates the log number among 100 entries(logs)
2) Description.
3) Date/ Time of the system log occurred.

- Press F1(prev) key for previous screen and F2(Next) for next screen
- Press "ESC" key to return to Log Information screen
- Press "ESC" key to return to Configuration Screen from Log Information screen

B. Selecting Specific Frequency for Scanning at Real Time Spectrum

Press "MENU" key, "F1(Real time)" key to bring real time Spectrum Screen.
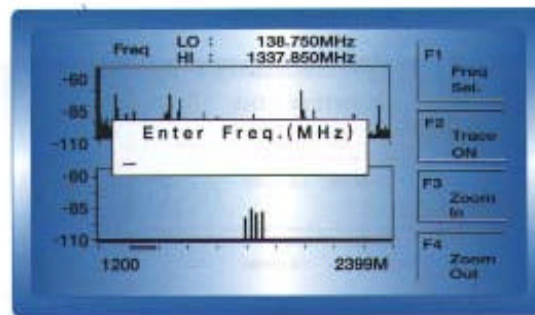
< Real time Spectrum Screen >

How to Enter a Specific Frequency manually
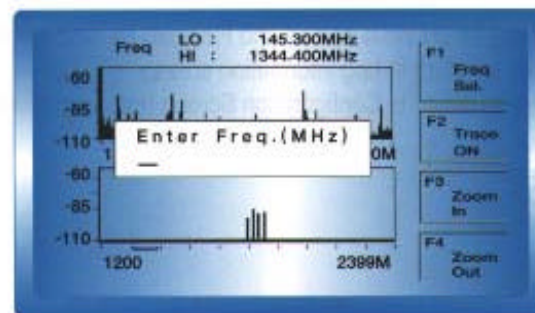
1) Press "F1(Freq. Sel)" key and enter frequency manually by using numeric keypads.
2) Press "ESC" key to cancel.

3) "DEL" key will delete the entry by one digit.

4) After completion of numeric value, press "ENTER" key to complete.
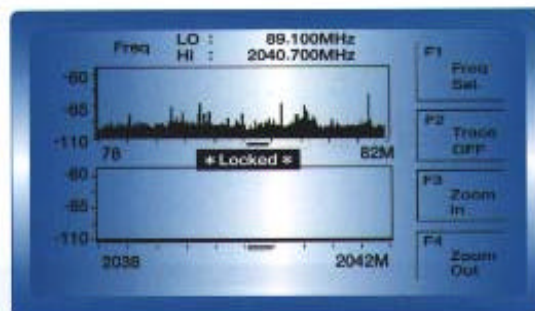
· The entry value(frequency) will be shown at real time spectrum screen by number and by cursor(in the range of +/- 2 MHz from the entry value)

In the above picture, 89.1 MHz was manually entered.
In the low Band Frequency, it shows 89.1 MHz. In the Low Band spectrum graph, the cursor was   moved to 89.1MHz. The left end of the cursor is read as 89.1 MHz.

· "Locked" appear on the screen indicating that Watchdog™ is scanning a specific frequency.
· Press any key and "Locked" message will disappear and WatchDog™ will be back to scan the entire range of frequency by 50kHz interval.

How to Locate a Specific Frequency from the Screen

1) Press "F2(Trace Off)" key to be in Trace Off Status.

2) Use F3(Zoom IN-200% enlarged view) and F4(Zoom out-50% reduced view) and directional key to place cursor on the spectrum graph.

3) The left end of the cursor is actual frequency and it will be shown on the screen with numbers.

4) Low Band Frequency Range: between 1.7 MHz and 1200 MHz

5) High Band Frequency Range: between 1200 MHz and 2399 MHz.

C. Event List Review

Event list is the record of the latest 10 events occurred.

Event List

Press "MENU" , "F2" to bring "Event List Screen"

① #
Event Number

② Date
The date the event occurred

③ Time
The time the event occurred

④ Freq(MHz)
Frequency that event occurred.

⑤ AS(Alarm Status)
There are 4 types of Alarm Status.

· Use Direction Key to move cursor (inverse bar) to the targeted event.
· Press "Enter" key to bring "Event in Detail" screen.

Event in Detail Screen
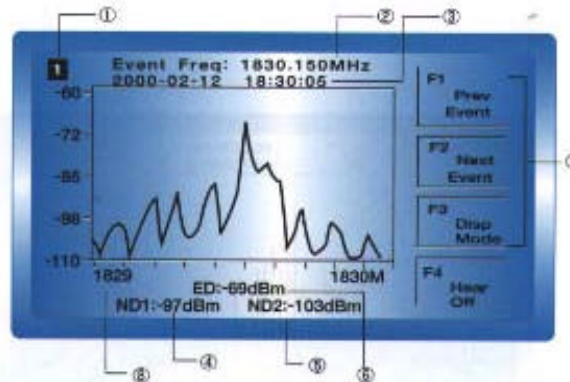
① Event Number.

② Event Frequency

③ Time/Date of Event occurred

④ ND1(Normal Density 1)
   The average density of the frequency for the first 24 hours after setup.

⑤ ND2(Normal Density 2)
   The average of density of the frequency detected most recently.

⑥ ED(Event Density)
   The density of the frequency of the event

⑦ F1, F2, F3, F4
   Function key

⑧ Frequency spectrum at the moment the event occurred. (1 MHz range from the event frequency)

· Press "F4(Hear ON/OFF)" key to "Hear On" to listen to the voice/sound at the frequency. Connect headphone to headphone jack on the WatchDog™ unit.
· Press "ESC" key to return to Event List screen
· You can move to previous or next event screen using F1(Previous), and F2(Next) key.

Display Mode

At the Event in Detail Screen, press "F3(Disp Mode)" key to change between Bar graph and Line Graph.
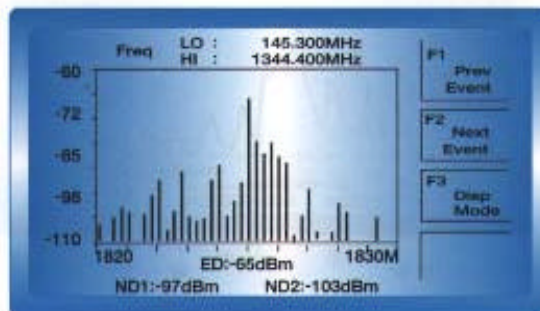
Press "ESC" key to return to Event List Screen.

How to Delete Event List Entry

There are 10 entries in the Event List. You can delete one by one.

- At the Event List Screen, move cursor by using direction keys to select a specific entry
- Press "DEL" key and this bring Password Box
- Enter the 4 digit password and press "ENTER" key.
- The entry is deleted. However, when an entry in the Event List is deleted, the entry at Event Trend is not deleted automatically.

D. Event Trend Review

This is to display the Event Trend with information on frequency density and its occurring time.

Press "MENU" key "F3(Event Trend)", this will bring "Event Trend" screen.

Event Trend Screen
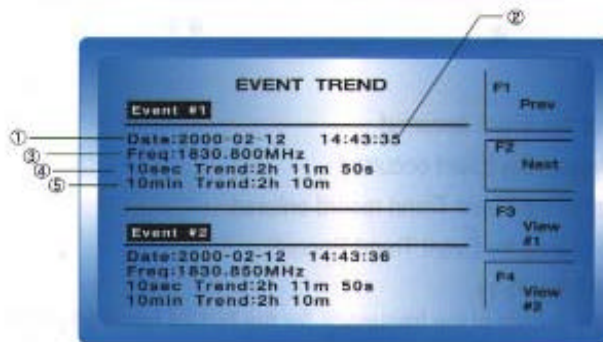
① Date: Date of event occurred

② Time of the event occurred

③ Frequency of Event occurred

④ Total period of time that event the density of frequency is recorded(by every 10 seconds interval). On the screen, 2h 11m 50s indicates that the density of the event frequency is recorded every 10 seconds for 2 hours 11 minutes 50 seconds. Maximum period of time for this record is 100 hours.

⑤ Total period of time that event the density of frequency is recorded(by every 10 minutes interval). Maximum period of time for this record is 8600 minutes.

· You can bring Event Trend in Detail screen by using F1-F4 function keys

Event Trend in Detail Screen
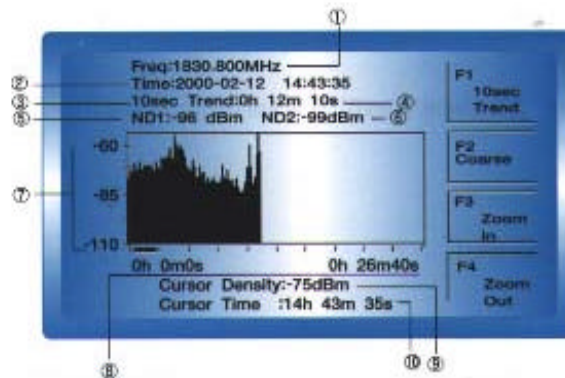
① Frequency of the Event occurred

② Time and Date of the Event occurred

③ Time interval of the Event Trend record entered

④ Total period of time for Event Trend Record

⑤ ND1(Normal Density 1)
   -The average density of the frequency for the first 24 hours after setup.

⑥ ND2(Normal Density 2)
   -The average of density of the frequency detected recently.

⑦ Frequency Density(dBm)

⑧ Scale of the period of time shown

⑨ Cursor Density-the density of the frequency at which time cursor is located.(dBm)

⑩ Cursor Time-Actual time at cursor is located.

Viewing Event Trend Information recorded by 10 seconds or by 10 minutes

· Press "Menu" "F3(Event Trend)", "F3" or "F4"
· Press "F1(10 sec trend)" key to bring Event Trend record by every 10 seconds.
· Press "F1(10 minutes)" key to bring Event Trend record by every 10 minutes.

```
Freq:1830.800MHz
Time:2000-02-12   14:43:35
10sec Trend:0h 12m 10s
ND1:-96dBm      ND2:-99dBm
-60
-85
-110
0h 0m0s              0h 26m40s
    Cursor Density:-75dBm
    Cursor Time  :14h 43m 35s
```

F1: 10sec Trend
F2: Coarse
F3: Zoom In
F4: Zoom Out

F1

```
Freq:1830.800MHz
Time:2000-02-12   14:43:35
10min Trend:0h 20m
ND1:-96dBm      ND2:-99dBm
-60
-85
-110
0h 0m                26h4m
    Cursor Density:-75dBm
    Cursor Time  :14h 43m 35s
```

F1: 10min Trend
F2: Coarse
F3: Zoom In
F4: Zoom Out
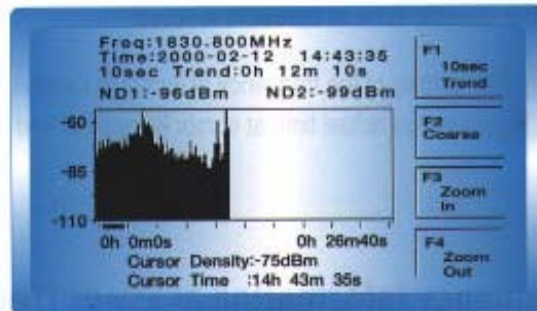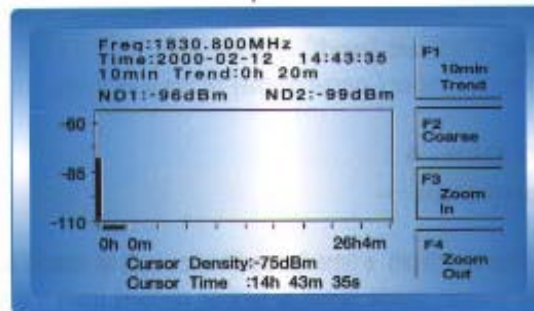
The density of the frequency at the event is recorded by every 10 second and also by every 10 minutes. Move Cursor to far right end of the spectrum to monitor that new graph is being drawn on the screen as time passes by.
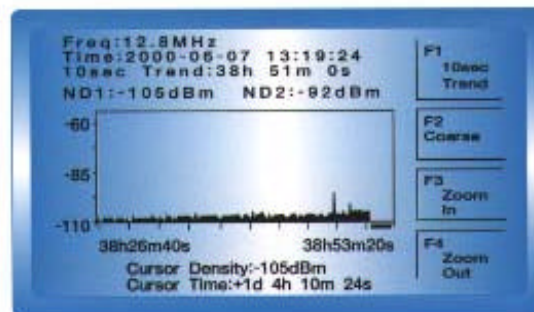
```
Freq:12.8MHz
Time:2000-06-07  13:19:24
10sec Trend:38h 51m 0s
ND1:-105dBm     ND2:-92dBm
-60
-85
-110
38h26m40s            38h53m20s
    Cursor Density:-105dBm
    Cursor Time:+1d 4h 10m 24s
```

F1: 10sec Trend
F2: Coarse
F3: Zoom In
F4: Zoom Out

· How to move Cursor

1) Use direction key to move specific time of the event.(◄, ►)

2) Direction key(up)▲ will take cursor to the original location where the event recording started.

3) Direction key(down) ▼will take cursor to recent location.

· **Information of the specific time at cursor is located.**

1) Cursor Density-The density of the frequency at cursor is located.
2) Cursor Time: This indicates actual time at cursor is located. +1d means next day.

Viewing Frequency Information at Event Trend in Detail Screen

Press "MENU" key, "F3(Event Trend)" "F3" or "F4"
Press "F2" key to bring Fine or Coarse display of the spectrum.

Fine Mode: Cursor shape : ▲
Coarse Mode: Cursor shape : —

· Coarse Mode-The spectrum' s time lapsed(horizontal) is scaled by 10.
· Fine mode-The coarse mode scale is further divided from the Coarse mode by 16 small scale.
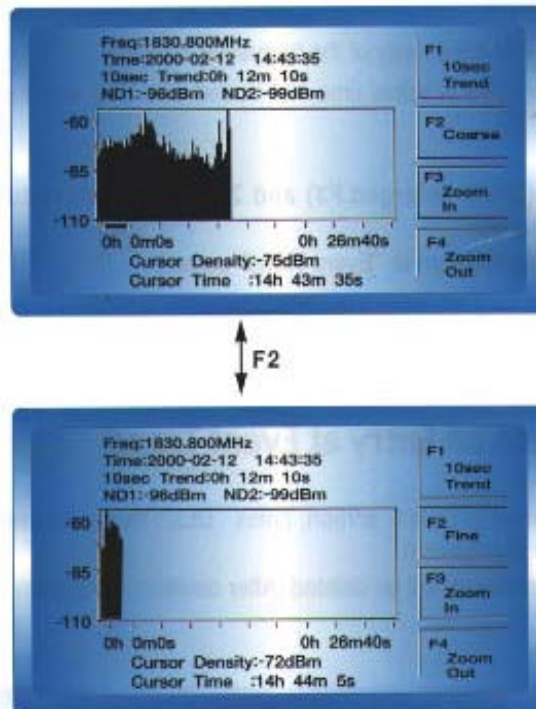
- Cursor Location indicates a specific time of the event occurred. When cursor moves to other location, the value of Cursor density and cursor time(actual time, not lapsed time) changes
- The time in the left and right bottom indicates the time lapsed after the event occurred.
- The one unit of horizontal scale at Coarse mode is equivalent 16 units of that of Fine mode.

· How to move Cursor

1) Use direction key to move specific time of the event.(◄ , ►)
2) Direction key(up)▲ will take cursor to the original location where the event recording started.
   Direction key(down) ▼ will take cursor to recent location.

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· **Cursor Location and Information**

1) Cursor Density-the density of the frequency in dBm
2) Cursor Time; This is actual time, not lapsed time after event occurred. +1d means next day.

· **Move Zoom In(200% enlarged,F3) and Zoom out(50% reduced, F4) for better viewing of the screen**

Press "ESC" key to return to "Event Trend" screen

How to Delete an Entry at Event Trend

At the "Event Trend in Detail" screen, press "DEL" key and password entry box pops up Enter the 4 digit password.

All the data in the screen will be deleted. After deletion, the screen will change to "Event Trend" screen.
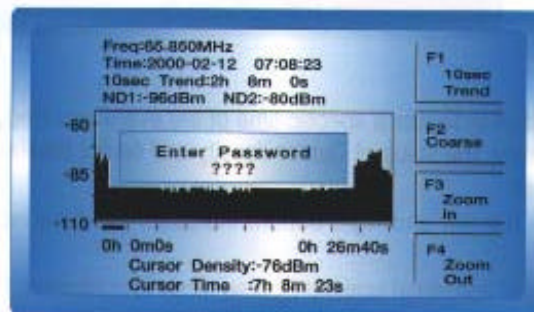
Appendix

Appendix 1 –Menu Table

Menu		
F1:Real Time	F1 : Freq. Sel F2 : Trace On ◄—— F2 ——► Trace Off F3 : Zoom In F4 : Zoom Out	

F2:Event List	F1 : Previous Event F2 : Next Event F3 : Display Mode F4 F4 : Hear Off ◄———► Hear On

F3:Event Trend
- F1 : Previous
- F2 : Next
- F3 : View #1 or #3
  - F1 : 10sec Trend ◄— F1 —► 10min Trend
  - F2 : Coarse ◄— F2 —► Fine
  - F3 : Zoom In
  - F4 : Zoom Out
- F4 : View #2 or #4
  - F1 : 10sec Trend ◄— F1 —► 10min Trend
  - F2 : Coarse ◄— F2 —► Fine
  - F3 : Zoom In
  - F4 : Zoom Out

F4:Setup
- F1:Edit Enter Password
  - F1:Exit
    - Yes:Enter
    - No :Esc
  - F2:Init Value
  - F3:Password
  - F4:Date & IP
    - F1:Save
    - F2:Cancel
    - F3:Date
    - F4:IP
- F2:Frequency Table
  - F1:Previous Page
  - F2:Next Page
  - F3:Edit
- F3:Link Info
- F4:Log
  - F1:Event Log
    - F1:Previous
    - F2:Next
  - F2:System Log
    - F1:Previous
    - F2:Next
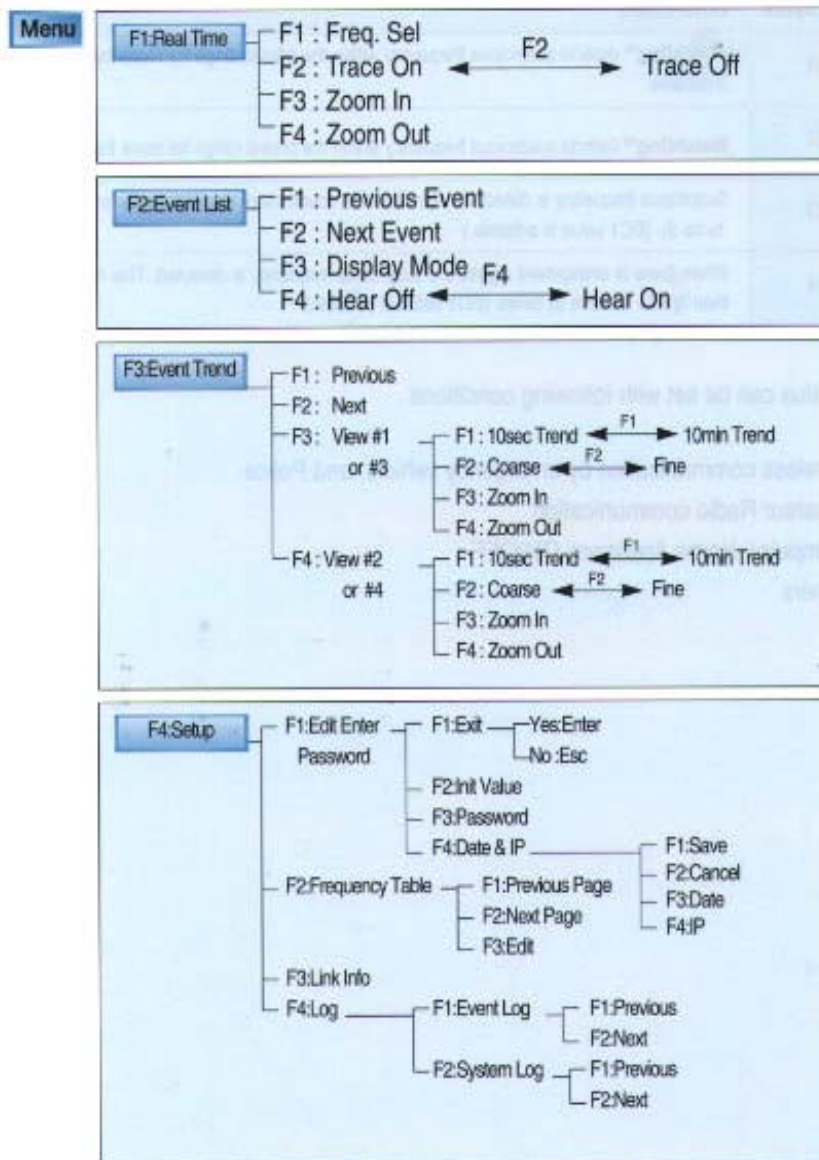
Appendix 2-Alarm Status

Alarm Status	Description
AS1	**WatchDog™** detects suspicious frequency within the preset range for more than 3 minutes
AS2	**WatchDog™** detects suspicious frequency within the preset range for more than 10 minutes
AS3	Suspicious frequency is detected when there is sound more than 3 times(when EC1 is set to be 3). (EC1 value is editable.)
AS4	When there is entrapment signal, the suspicious frequency is detected. This happened more than 3(EC1 value is 3) times. (EC1 value is editable).

Alrm status can be set with following conditions .

1) Wireless communication by emergency vehicle, and Police
2) Amateur Radio communication
3) Computer, Home Appliance ON/OFF
4) Others

Appendix 3-Shortcut Key Index

Description	Key Entry	Page
Return to previous screen	ESC	
Delete	DEL →(password)	
Acknowledgement of Alarm Event occurred	ACK	
Entering specific frequency for scanning	MENU→F1→F1→(entering frequency)→Enter	
Scanning entire range of frequency	MENU→F1→F2→Direction Key or→F3→(Zoom In)→F4(Zoom Out)	
Indexing of the Event List	MENU→F2	
Event Information View	MENU→F2→(Direction key)→ENTER→F4	
Selecting graph type at Event Trend	MENU→F2→(Direction Key)→ENTER→F3	
Event Trend List	MENU→F3→F1 OR F2	
View Event Trend Graph	MENU→F3→F1 OR F2→F3 OR F4	
Event Trend Information recorded by every 10 seconds, or by every 10 minutes	MENU→F3→F1 or F2→F3 or F4→F1	
Viewing frequency information at specific time at Event Trend	MENU→F3→F1 or F2→F3 or F4→Direction Key or F3→(Zoom In), F4(Zoom out)→F2→(Direction Key)→F3(Zoom In), F4(Zoom Out)	
Viewing initial setting	MENU→F4	
Editing basic setting	MENU→F4→F1(password) →select the item to be edited with Direction Key→edit with numeric keypads or direction keys→F1 →ESC or ENTER	
Editing Password	MENU→F4→F1(new password entry)→F3	
Setting Time and Date	MENU→F4→F1(password)→F4	
Editing user defined Frequency Table	MENU→F4→F1→F1(password)	
Monitoring neighboring WatchDog™	MENU→F4→F3	
Viewing Event List	MENU→F4→F4→F1	
Viewing System Log	MENU→F4→F4→F2	

Appendix 4-Trouble Shooting.

No Power	1) Check whether power switch is on. 2) Check the power cord connection.
Power LED light is off	1) Check the power connection and switch. 2) If the connection is OK and still power LED light is not on, please consult with your nearest service center.
Keys are not working properly	1) Check whether Power LED is on. 2) Check whether an Event occurred. You must press "ACK" key after an event occurred before any other key star to work. 3) Turn the power off and turn back on
Alarm goes off but there is no alarm sound.	1) Press "ACK" key to acknowledge the event/alarm 2) Check whether speaker is "ON" (please refer to page 9 and 23)
LCD screen is not functioning properly	1) Check whether Power LED is on. 2) please consult with your nearest service center
The connection status is not shown at MMI after WatchDog™ units are connected each other	1) Check the cable connection(RS-232C, RS-485) 2) Check whether Power LED is on. 3) Refer to Page 31. Check whether the unit is shown as NR 4) Please consult with your nearest service center

Appendix 5–Technical Specification

Classification	Items	Contents
RF	Frequency Range	1.7MHz – 2.4GHz
	Receiver Sensibility	-110dBm ~ -60dBm
	Detection Range	1,000 ft'
	Scanning Step	50kHz
	Scanning Bandwidth	50kHz
	Antenna	1.7MHz~1.2GHz(Low Band)
		1.2GHz~2.4GHz(High Band)
Interface	RS-232C	1 Port(D-Sub 9 pin Male)
	Ethernet	10 Base T
	RS-485	2 Ports(Twist Pair)
	Discrete Input	DC24V 2 Points
	Discrete Output	DC 30V 1A, 2 points(Normal Open)
LCD	Viewing Area	127(W) X 70(H) mm
	Number of Dots	256(W) X 128(H) dots
Devices	LED	Power, Alarm
	Address Switch	1~32 address
	Speaker	0.4 Watt
	Internal Microphone	Condenser Type
	Headphone Jack	3-conductor 3.5mm/4-8 Ω
MMI PC Requirement	CPU	Celeron 333MHz
	RAM	64MB
	HDD	100MB of free memory space
	O/S	Microsoft™ Windows® 95/98
Physical Characteristics	Size	11.80" (W) × 6.89" (D) × 1.96" (H)
	Weight	6lb
	Color	Ivory or Black
Power	Power Consumption	17Watts
	AC	AC110~220V, Free Voltage

Warranty Information

Limited Warranty

Woori Technology("Woori") warrants this product(including any accessories) against defects in material or workmanship as follows.

1) LABOR : For a period of 90 days from the date of purchase, if this Product is determined to be defective, Woori will repair or replace the product, at its option, at no charge, or pay labor charges to any Woori authorized service center. After the warranty period, you must pay for all the charges.

2) PARTS : In addition, Woori will supply, at no charge, new or rebuilt replacement in exchange for defective parts for a period of one year.

To obtain warranty service, you must take the product, or deliver the product freight prepaid, in either its original packaging or packaging affording an equal degree of protection, to any Woori authorized Service Center.

This warranty does not cover customer instruction, installation, setup adjustments.

This warranty does not cover cosmetic damage or damage due to acts of God, accident, misuse, or modification of, or to any part of the product, including antenna. This warranty does not cover damage due to improper operation or maintenance, connection to improper voltage supply, or attempted repair by any one other than a facility authorized by Woori to service the product. This product does not cover Products sold "As Is" or with all faults, or consumables(such as fuse or batteries). This warranty is valid only in the United States.

This warranty is invalid if the factory applied serial number has been altered or removed from the Product.

Safeguard Information

Safeguards

- To reduce the risk of electric shock, do not expose this appliance to rain or moisture, do not operate **WatchDog™** with the cover removed.

- If the wall plug does not fit into your local power socket, then ask your electrician to replace your obsolete outlet. Do not modify the wall plug. To do so will void the safety feature.

Precautions:

Warning - FCC Regulations state that any unauthorized changes or modifications to this equipment not expressly approved by the manufacturer could void the user's authority to operate this equipment.

- Only operate your **WatchDog™** using the included external power supply. Use of other supplies could impair performance or damage your **WatchDog™** or could cause fires.

- Protect and route power cords so they will not be stepped on or pinched by anything placed on or against them. Be especially careful at plug-ins, or cord exit points from the **WatchDog™**.

- Do not cover or block ventilation holes in the **WatchDog™**. Doing so may damage the unit or cause improper operation.

- Avoid excessive humidity, sudden temperature changes or temperature extremes.

- Keep your **WatchDog™** away from wet locations such as bathtubs, sinks laundries, wet basements and swimming pools.

- Use only accessories recommended by the manufacturer to avoid fire, shock or otherhazards.

- Unplug your **WatchDog™** before cleaning. Use a damp cloth for cleaning. Do not use cleaning fluids or aerosols which could enter the unit and cause damage, fire or electrical shock. These substances may also mar the finish of your **WatchDog™**.

- Never open or remove covers or make any adjustments not described in this manual.

  Attempting to do so could expose you to dangerous electrical shock or other hazards. It may also cause damage to your **WatchDog™**.

- Do not attempt to service this unit. Instead, disconnect it and contact Woori.

- "WARNING - FCC Regulations state that any unauthorized changes or modifications to this equipment not expressly approved by the manufacturer could void the user's authority to operate this equipment.

WatchDog™